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Superfluidity of heated Fermi systems in the static fluctuation approximation

Khamzin A., Nikitin A., Sitdikov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015, Pleiades Publishing, Ltd. Superfluidity properties of heated finite Fermi systems are studied in the static fluctuation approximation, which is an original method. This method relies on a single and controlled approximation, which permits taking correctly into account quasiparticle correlations and thereby going beyond the independent-quasiparticle model. A closed self-consistent set of equations for calculating correlation functions at finite temperature is obtained for a finite Fermi system described by the Bardeen–Cooper–Schrieffer Hamiltonian. An equation for the energy gap is found with allowance for fluctuation effects. It is shown that the phase transition to the supefluid state is smeared upon the inclusion of fluctuations.

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